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Service Manual

414E BACKHOE LOADER

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Product: BACKHOE LOADER
Model: 414E BACKHOE LOADER ELB
Configuration: 414E Backhoe Loader ELB00001-UP (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
414E, 416E, 420E, 422E, 428E, 430E, 432E, 434E, 442E and 444E Backhoe Loaders Power Train
Media Number -RENR6475-13 **Publication Date -01/07/2017** **Date Updated -13/07/2017**

i02989945

System Pressure - Release

SMCS - 4250-553-PX; 4300-553-PX; 5050-553-PX

Release Procedure

1. Park on a level surface. If you must park on a grade, chock the machine.
2. Apply the service brake in order to stop the machine. Move the transmission control lever to the NEUTRAL position.
3. Move the speed control lever to the LOW IDLE position.
4. Engage the parking brake.
5. Engage the transmission neutral lock.
6. Lower all attachments to the ground.
7. Stop the engine.
8. Turn the engine start switch key to OFF position for 4 seconds.
9. Turn the engine start switch key back to ON position.
10. Press the hydraulic shutoff switch to the ON position.
11. Operate all hydraulic controls through all positions in order to relieve hydraulic pressure. Repeat this step until all hydraulic pressure is released.
12. Move the hydraulic control levers to the HOLD position.
13. Turn the engine start switch to OFF position and remove the key.

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Power Train

Media Number -RENR6475-13 **Publication Date -01/07/2017** **Date Updated -13/07/2017**

i06892787

Tire and Rim (Front) - Remove and Install

SMCS - 4202-010-FR

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1U-9745	Air/Hydraulic Jack Gp	1
B	180-3033	Repair Stand Set	2

Illustration 1 g01237930

1. Raise the bucket. Install cylinder lock (1).

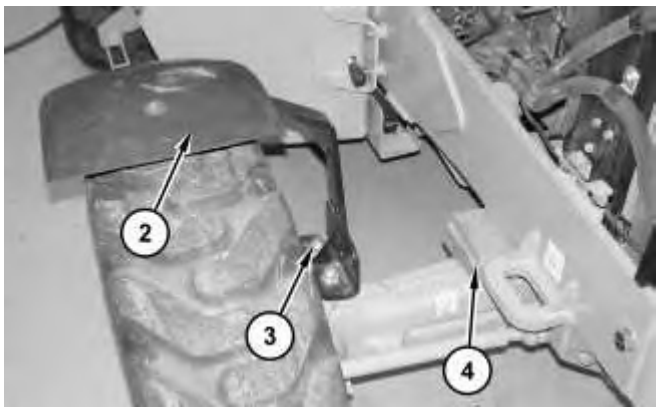

Illustration 2 g01116896

2. Remove nuts (3) and fender (2). Place suitable cribbing (4) between the front axle and the frame on each side of the machine. This will keep the front axle from oscillating.

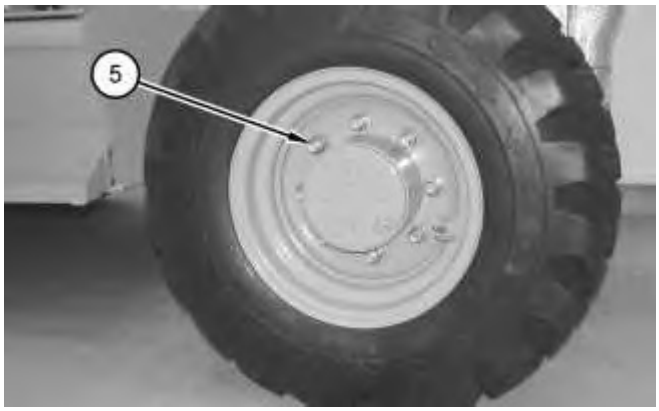

Illustration 3 g01116902

3. Loosen lug nuts (5). Do not remove lug nuts (5) now. Repeat for the other side.

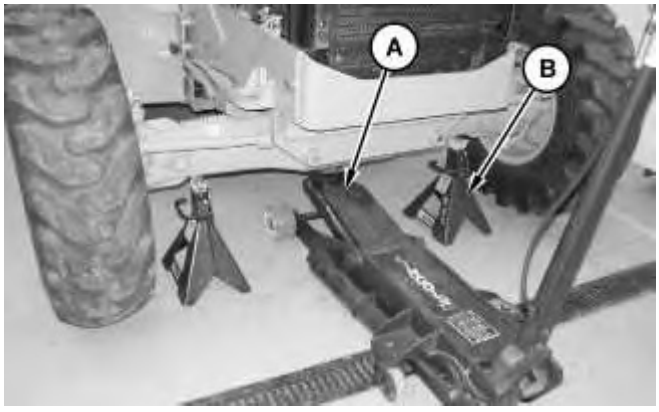

Illustration 4 g01116891

4. Use Tooling (A) to raise the machine. Position Tooling (B) under the frame of the machine. Use Tooling (A) to lower the machine onto Tooling (B).

Illustration 5 g01237945

5. Attach a suitable lifting device to the tire and rim (6). The combined weight of the tire and rim (6) is approximately 70 kg (155 lb). Remove lug nuts (5) and remove the tire and rim (6).

Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1U-9745	Air/Hydraulic Jack Gp	1
B	180-3033	Repair Stand Set	2

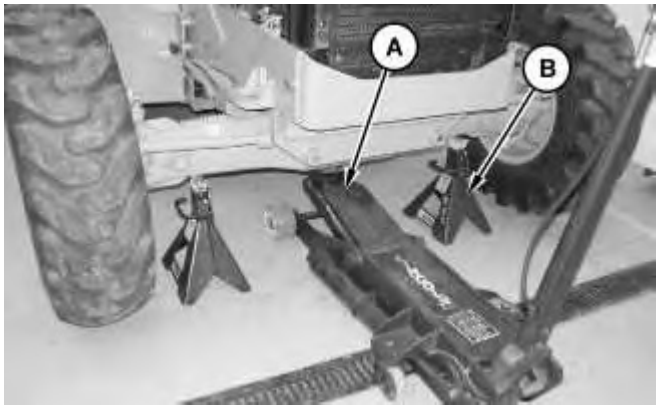

Illustration 6 g01116891

1. Use Tooling (A) to raise the machine.

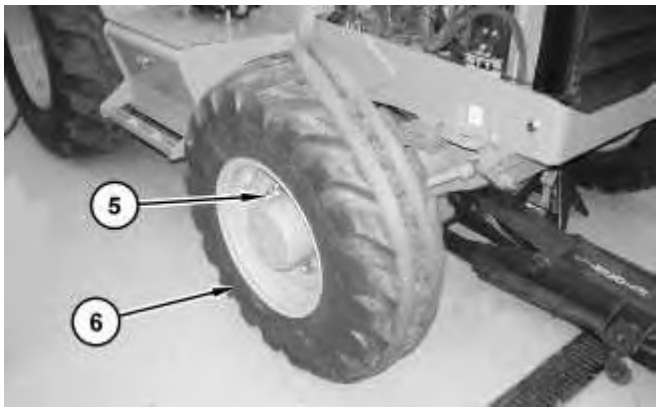

Illustration 7 g01237945

2. Attach a suitable lifting device to the tire and rim (6). The combined weight of the tire and rim (6) is approximately 70 kg (155 lb). Apply a drop of oil on lug nuts (5). Install the rear tire and rim (6) and install lug nuts (6). Do not tighten lug nuts (6) now.

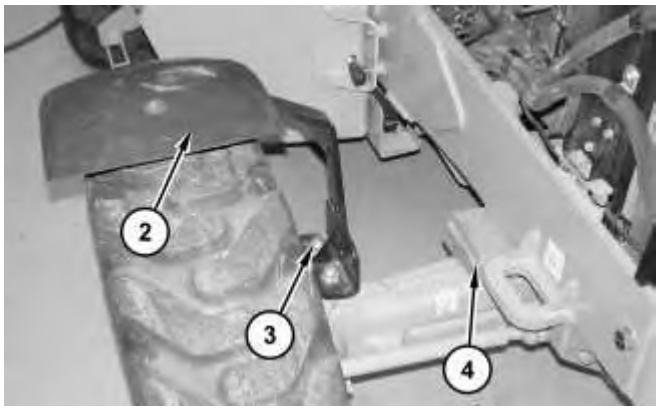

Illustration 8 g01116896

3. Install fender (2) and nuts (3). Remove suitable cribbing (4).

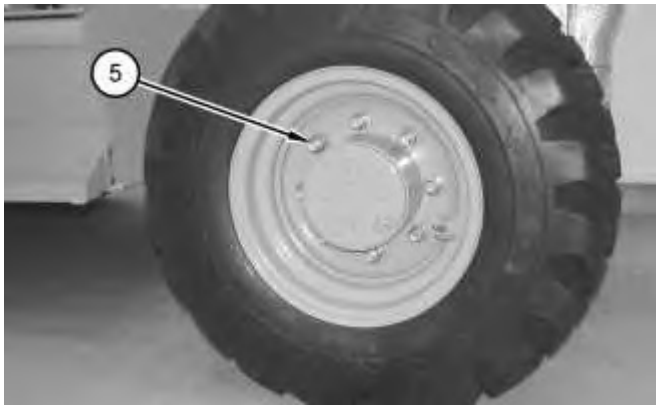

Illustration 9 g01116902

4. Remove Tooling (B) from the frame of the machine. Use Tooling (A) to lower the machine onto the ground. Tighten lug nuts (5) to a torque of 190 ± 40 N·m (140 ± 30 lb ft). Then, turn lug nuts (5) by an extra 60° ± 5°.

Illustration 10 g01237930

5. Remove cylinder lock (1).

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Model: 414E BACKHOE LOADER ELB
Configuration: 414E Backhoe Loader ELB00001-UP (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
414E, 416E, 420E, 422E, 428E, 430E, 432E, 434E, 442E and 444E Backhoe Loaders Power Train
Media Number -RENR6475-13 **Publication Date -01/07/2017** **Date Updated -13/07/2017**

i02307210

Tie Rod (Steering)(Front) - Remove and Install - Two-Wheel Drive

SMCS - 4318-010-ZH; 4318-010

S/N - BXE1-UP

S/N - CBD1-UP

S/N - DDT1-UP

S/N - DPH1-UP

S/N - EAT1-UP

S/N - ELB1-UP

S/N - FSH1-UP

S/N - GKZ1-UP

S/N - HBE1-UP

S/N - KMW1-UP

S/N - LBE1-UP

S/N - MFG1-UP

S/N - PHC1-UP

S/N - SHA1-UP

S/N - TMS1-UP

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1P-2321	Combination Puller	1

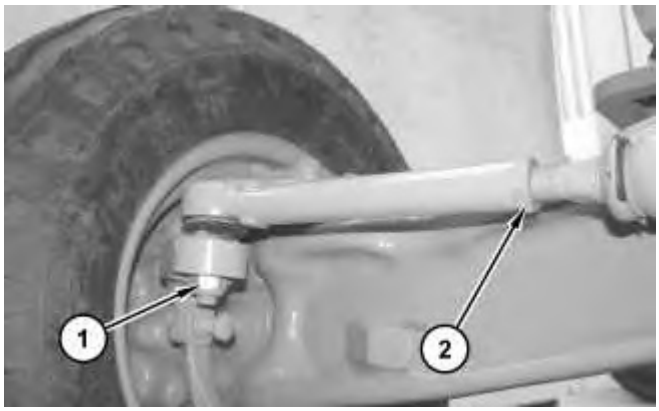

Illustration 1 g01155584

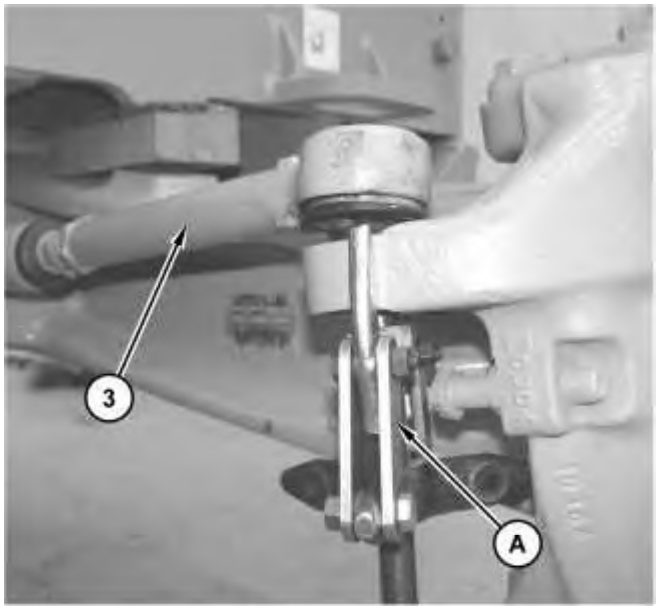

Illustration 2 g01155586

1. Loosen nut (1). Loosen nut (2).
2. Use Tooling (A) in order to disconnect tie rod (3) from the steering knuckle. Remove nut (1). Remove tie rod (3).

Installation Procedure

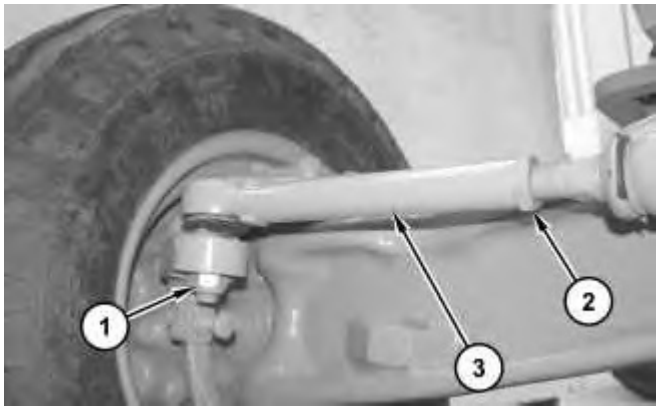

Illustration 3 g01155609

1. Install tie rod (3).
2. Tighten nut (2). Install nut (1). Tighten nut (1) to a torque of 250 N·m (184 lb ft). Tighten nut (2) to a torque of 220 N·m (162 lb ft).

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Media Number -RENR6475-13 **Publication Date -01/07/2017** **Date Updated -13/07/2017**

i05415863

Tie Rod (Steering)(Front) - Remove and Install

SMCS - 4318-010-ZH; 4318-010

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1P-2320	Combination Puller	1

Start By:

a. Remove the front tires and rims. Refer to Disassembly and Assembly, "Tire and Rim (Front) -Remove and Install".

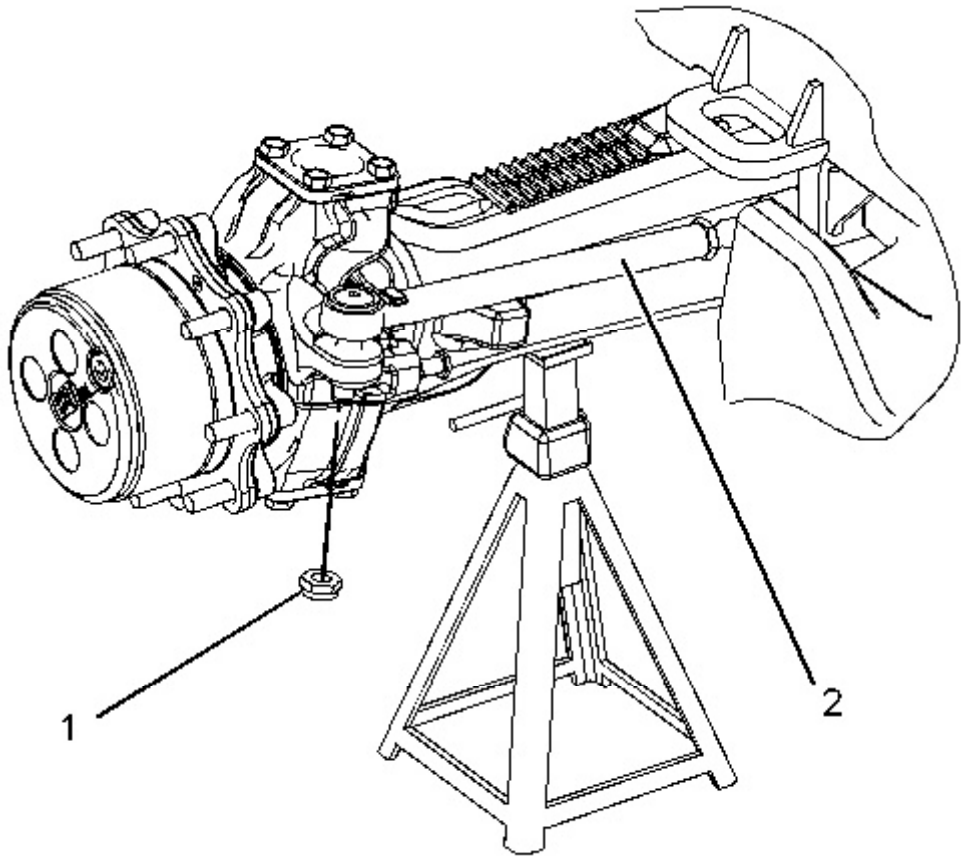

Illustration 1 g01117258

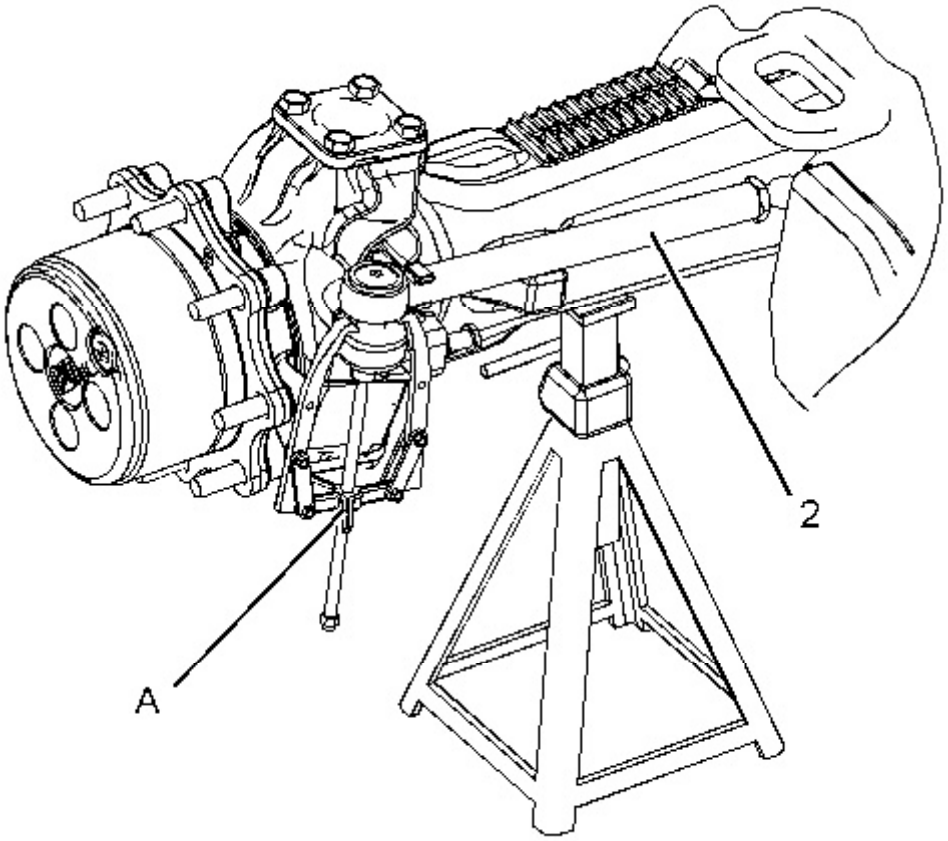

Illustration 2 g01117260

1. Loosen nut (1) from tie rod (2).
2. Use Tooling (A) in order to disconnect tie rod (2). Remove nut (1) and remove tie rod (2).

Installation Procedure

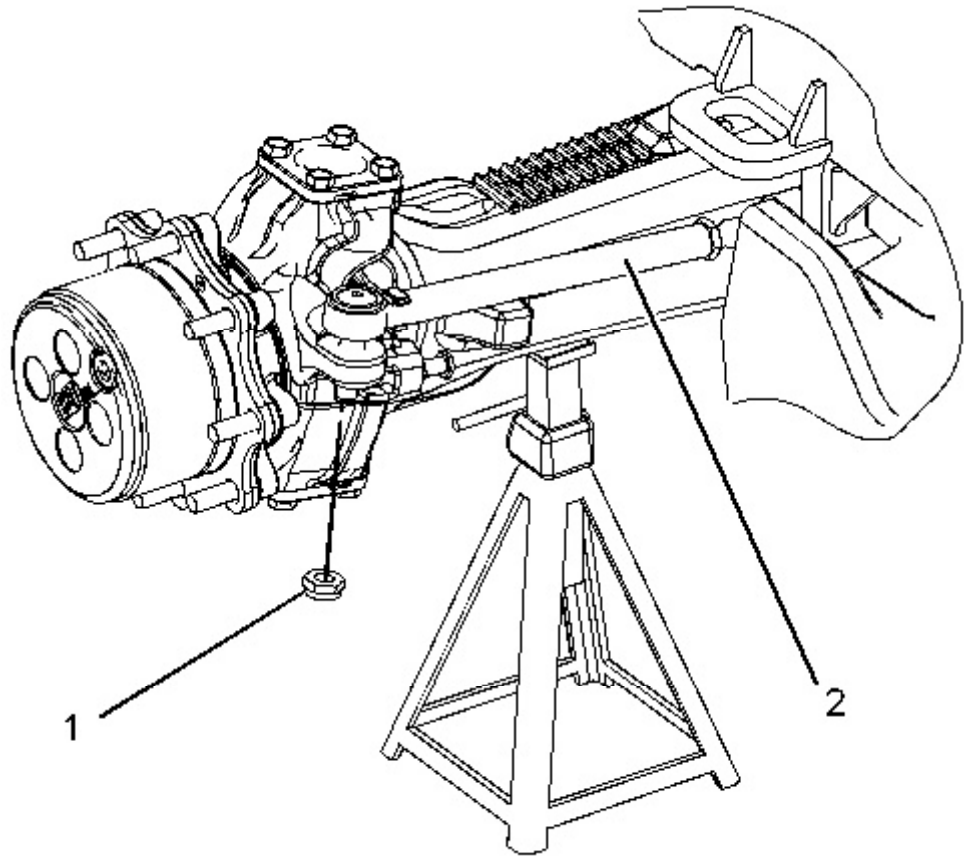

Illustration 3 g01117258

1. Install tie rod (2).
2. Install nut (1). Tighten nut (1) to a torque of 220 N·m (162 lb ft).
3. Tighten the end of tie rod (2) that fastens into the steering cylinder to a torque of 300 + 15 - 45 N·m (220 + 11 -33 lb ft)

End By:

a. Install the front tires and rims. Refer to Disassembly and Assembly, "Tire and Rim (Front) - Remove and Install".

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Configuration: 414E Backhoe Loader ELB00001-UP (MACHINE) POWERED BY 3054 Engine

Disassembly and Assembly
414E, 416E, 420E, 422E, 428E, 430E, 432E, 434E, 442E and 444E Backhoe Loaders Power Train

Media Number -RENR6475-13 **Publication Date -01/07/2017** **Date Updated -13/07/2017**

i03664881

Steering Cylinder (Front) - Remove and Install

SMCS - 4303-010-FR

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1P-2320	Combination Puller	1
B	155-0695	Thread Lock Compound	-

Start By:

A. Remove the front axle. Refer to Disassembly and Assembly, "Drive and Steering Axle (Front) - Remove".

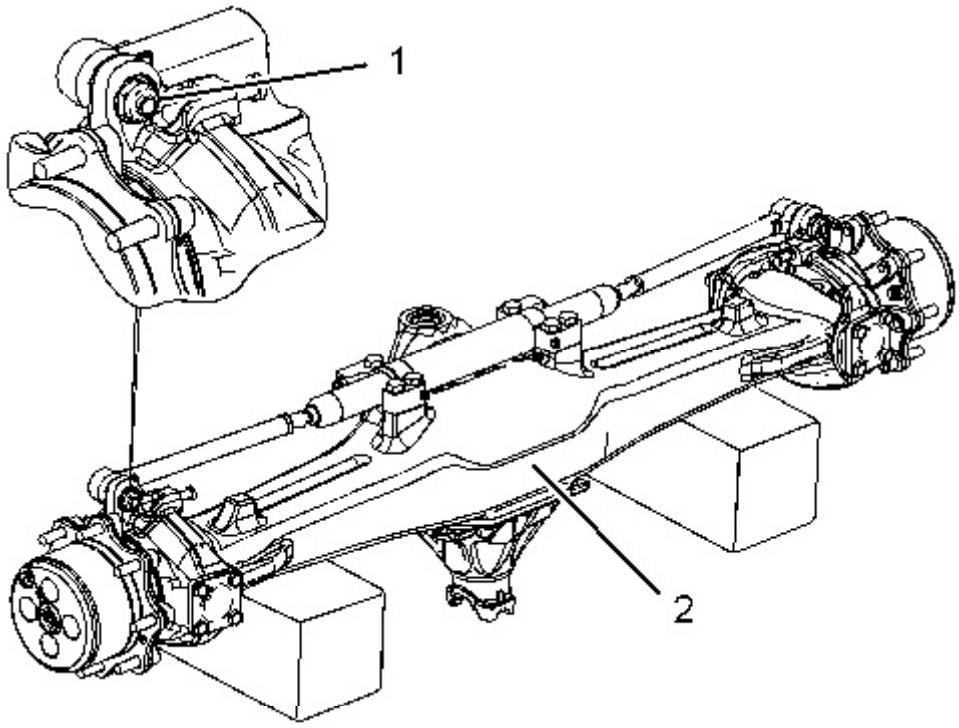

Illustration 1 g01117223

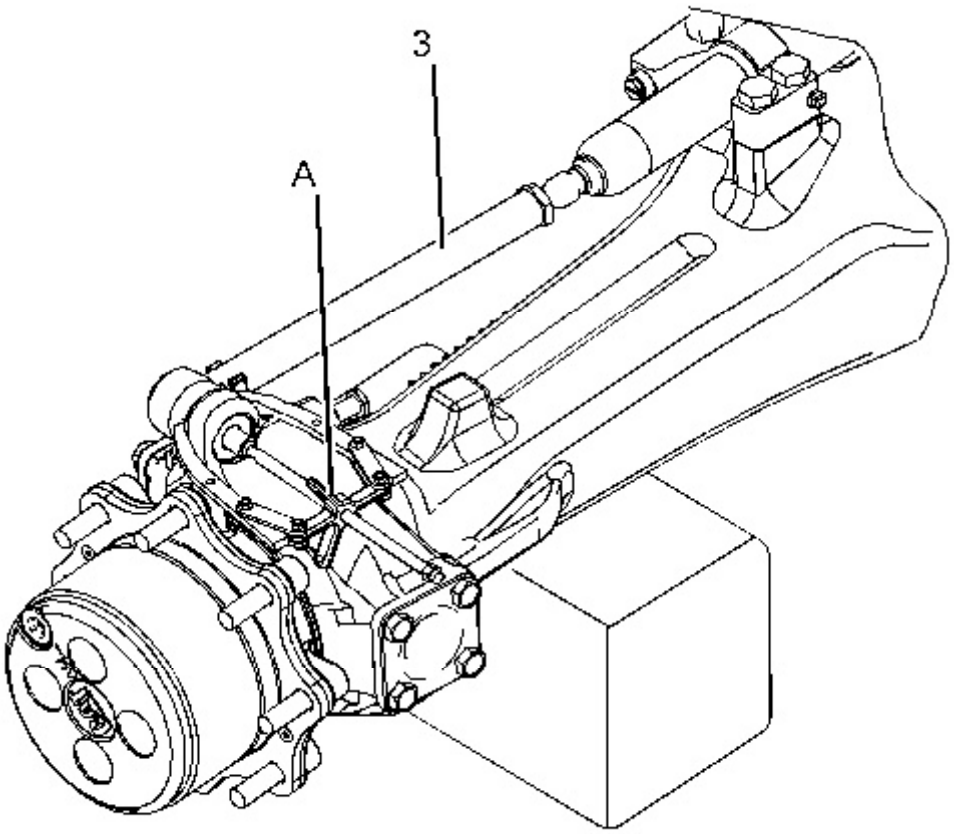

Illustration 2 g01117229

1. Place front axle assembly (2) onto suitable cribbing. Loosen nut (1) from each side.
2. Use Tooling (A) in order to disconnect tie rod (3) . Remove nut (1) and remove tie rod (3) . Repeat for the other side.

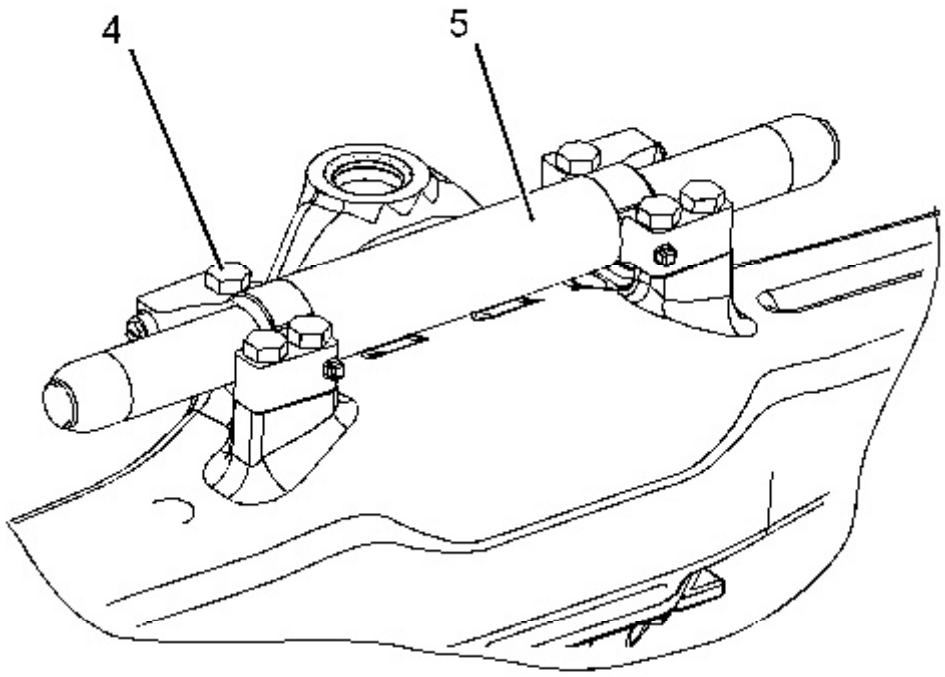

Illustration 3 g01117236

3. Remove bolts (4) and remove steering cylinder (5) .

Installation Procedure

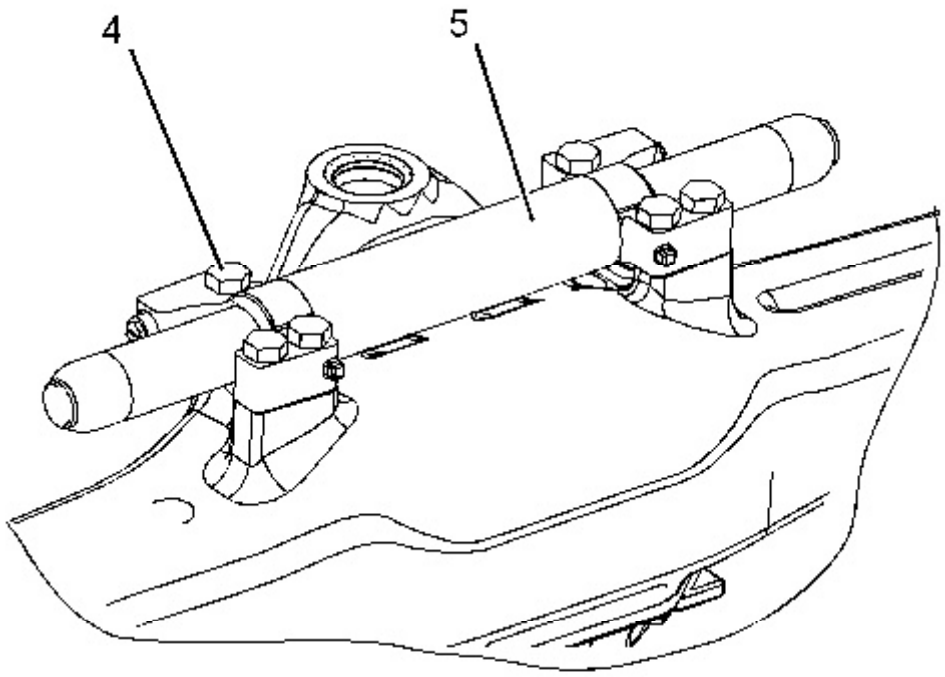

Illustration 4 g01117236

1. Install steering cylinder (5) . Apply Tooling (B) to bolts (4) and install bolts (4) . Tighten bolts (4) to a torque of 460 N·m (340 lb ft).

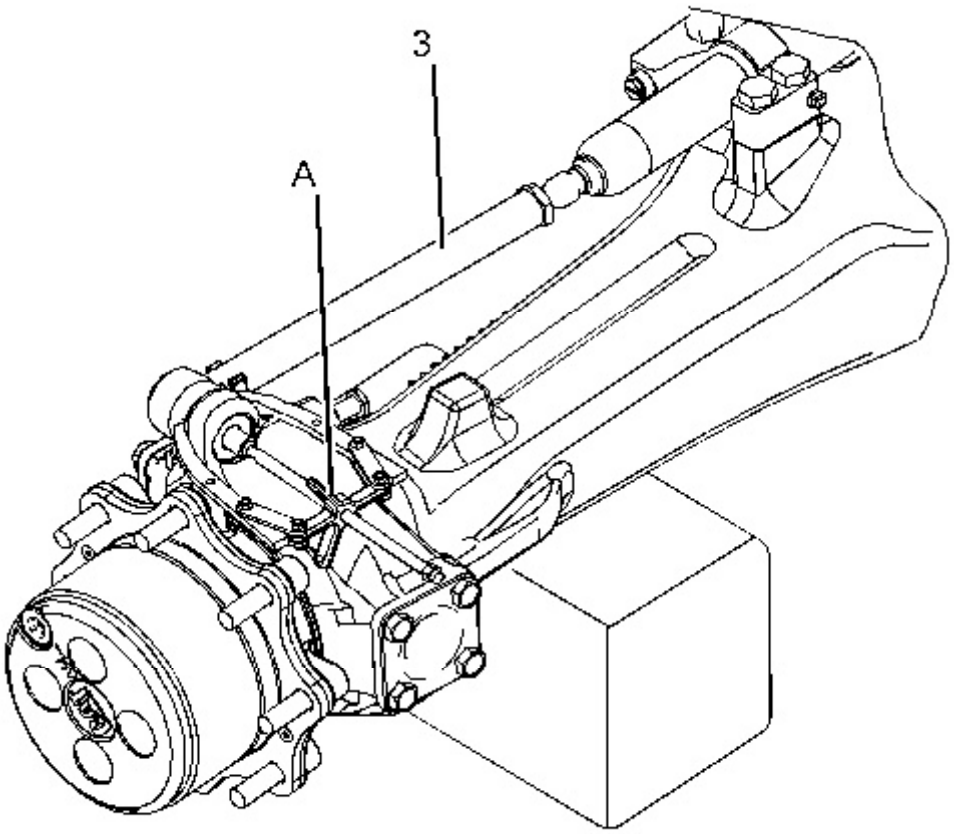

Illustration 5 g01117229

2. Install tie rod (3) . Repeat for the other side.

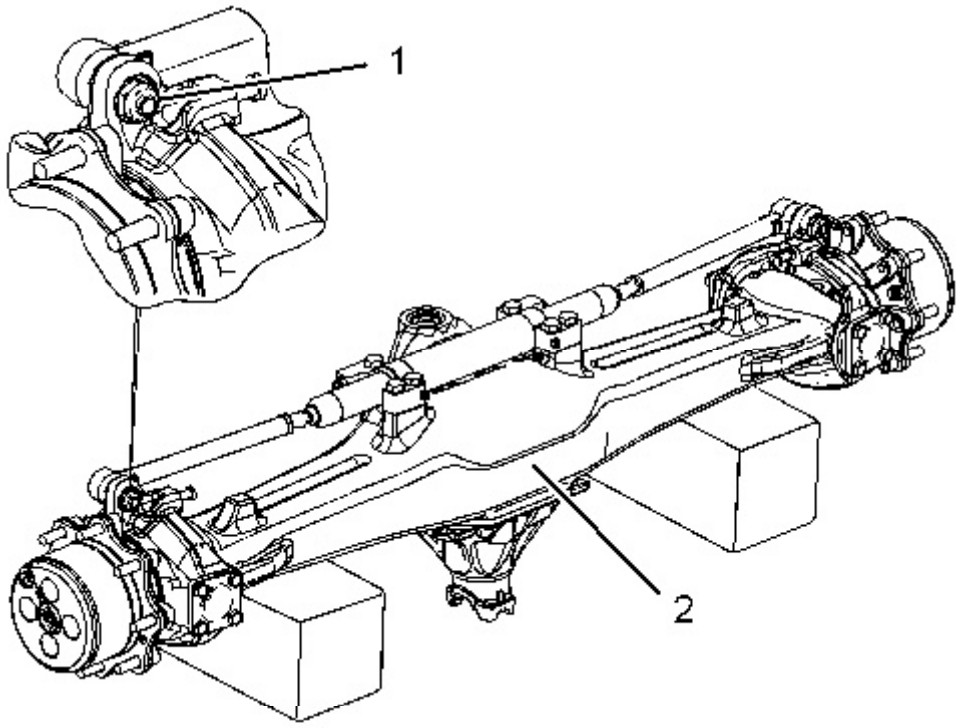

Illustration 6 g01117223

3. Install nut (1) to each side of front axle assembly (2) . Tighten nut (1) to a torque of 220 N·m (162 lb ft).

End By: Install the front axle. Refer to Disassembly and Assembly, "Drive and Steering Axle (Front) - Install".

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Media Number -RENR6475-13 **Publication Date -01/07/2017** **Date Updated -13/07/2017**

i03664901

Steering Cylinder (Front) - Remove and Install - Two-Wheel Drive

SMCS - 4303-010-FR

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	155-0695	Thread Lock Compound	-

Start By:

A. Release the hydraulic system pressure. Refer to Disassembly and Assembly, "Hydraulic System Pressure - Release".
B. Remove the tie rods. Refer to Disassembly and Assembly, "Tie Rod (Steering) (Front) - Remove".

Note: Put identification marks on all lines, on all hoses, on all wires, and on all tubes for installation purposes. Plug all lines, hoses, and tubes. This helps to prevent fluid loss and this helps to keep contaminants from entering the system.

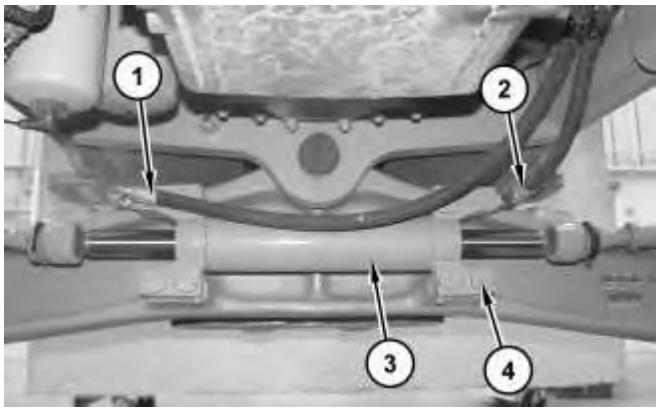

Illustration 1 g01238002

1. Disconnect hose assemblies (1) and (2) . Remove bolts (4) and steering cylinder (3) .

Installation Procedure

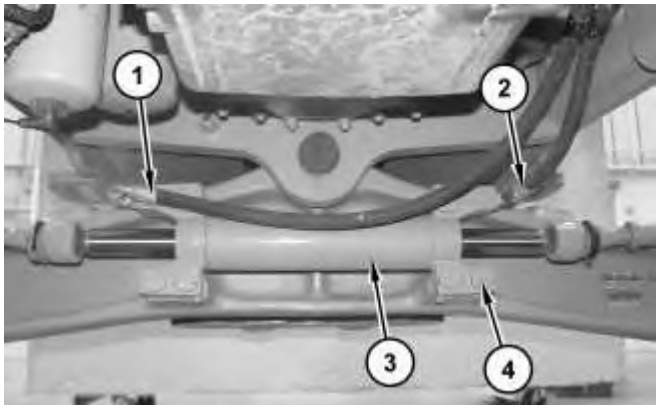

Illustration 2 g01238002

1. Install steering cylinder (3) and bolts (4) . Apply Tooling (A) to bolts (4) and install bolts (4) . Tighten bolts (4) to a torque of 460 N·m (340 lb ft). Connect hose assemblies (1) and (2) .

End By: Install the tie rods. Refer to Disassembly and Assembly, "Tie Rod (Steering) (Front) - Install".

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i02106590

Final Drive Planetary - Remove

SMCS - 4050-011; 4084-011

Removal Procedure

Start By:

a. Remove the wheel and tire. Refer to Disassembly and Assembly, "Wheel and Tire - Remove and Install".

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

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1. Drain the oil from the final drive planetary into a suitable container for storage or disposal. Refer to Operation and Maintenance Manual, "Final Drive Planetary (Axle) Oil - Change".

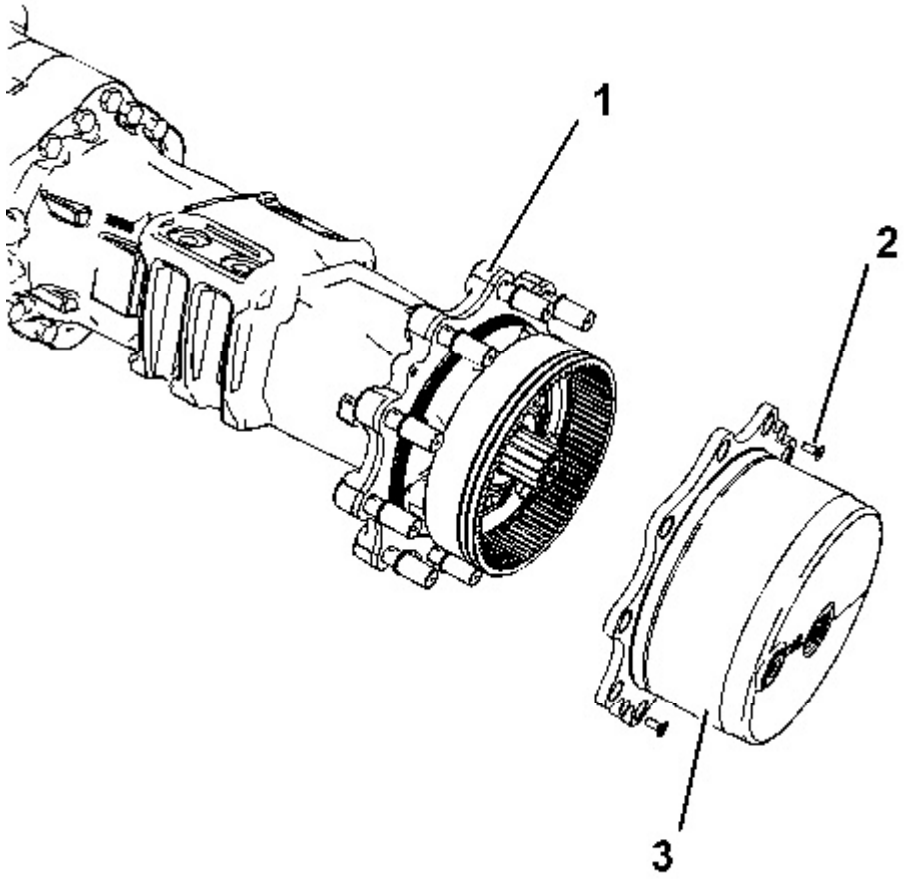

Illustration 1 g01072848

2. Remove screws (2) and remove planetary carrier assembly (3) from wheel flange (1).

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